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GUIDE FOR UNITS USED IN AIR QUALITY MEASUREMENTS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 31 October 1980, after the draft finalized by the Air Quality Sectional Committee had been approved by the Chemical Division Council.

0.2 The series of Indian Standards relating to air pollution includes the standardization of procedures for measurement of pollutants. In order to enable results to be compared within or between organizations, it is essential to use agreed units of measurement to report the results and other relevant information so that sound conclusions may be drawn. It is also desirable to keep the number of units of measurement to a minimum.

0.3 This standard lays down the units to be used and the data generally given in reports of air pollution measurements. For general guidance on the International System of Units, reference should be made to SP : 5-1969*.

0.4 In the preparation of this standard, considerable assistance has been drawn from ISO 4226-1980 'General aspects of air quality — Units of measurement', issued by the International Organization for Standardization.

1. SCOPE

1.1 This standard lays down the units and symbols to be used while reporting results of measurements made in relation to air pollution, both for ambient air quality and emissions.

2. UNITS

2.1 Units for Quantity of Materials

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*Guide to the use of International System (SI) units.

2.1.1 *Gases and Vapours*

Quantity	*Unit*	*Symbol*
a) Volume fraction of main constituents of air (for example, nitrogen, oxygen, carbon dioxide)	percent (by volume)	% (*v*/*v*)
b) Gaseous pollutants in ambient air	microgram per cubic metre	$\mu g/m^3$
c) Gaseous emissions	gram per normal cubic metre	g/m^3 (normal)
	milligram per normal cubic metre	mg/m^3 (normal)

NOTE — The units of $\mu g/m^3$, mg/m^3 and g/m^3 express concentration of mass per volume and because the mass of a volume of gas depends on temperature and pressure, the cubic metre can only be considered for accurate results if ambient temperature and pressure are recorded. Gaseous pollutants have often been expressed on a ppm basis or milligram per litre (mg/l) basis. In case of gaseous emissions, temperature and pressure shall always be recorded. ' Normal ' indicates 25°C and 101 kPa (1 atm) pressure.

2.1.2 *Particles*

Quantity	*Unit*	*Symbol*
a) Mass concentration of suspended matter	milligram per cubic metre	mg/m^3
	microgram per cubic metre	$\mu g/m^3$
	nanogram per cubic metre	ng/m^3
b) Size of particles	micrometre or micron	μm
c) Atmospheric dustfall (deposit gauges)	gram per square metre thirty days	g/m^2 30 d
	milligram per square metre thirty days	mg/m^2 30 d
	milligram per square metre day	mg/m^2 d

Quantity	*Unit*	*Symbol*
d) Biological, microbiological and other suspended matter (for example; pollen, spores, microorganisms)	reciprocal cubic metre	$1/m^3$
	reciprocal cubic decimetre	$1/dm^3$

Note — When deposit gauges are used, no account is taken of the volume of air from which the dust is deposited; the duration of collection of the deposit should also be reported.

2.2 Units for Specifying the State of Gas

Quantity	*Unit*	*Symbol*
a) Temperature	degree Celsius	°C
b) Pressure	kilopascal	kPa
	millibar	mbar
c) Humidity	percentage relative humidity	%rh

Note — It is desirable to increasingly use kilopascal instead of millibar.

2.3 Meteorological Quantities

Quantity	*Unit*	*Symbol*
a) Wind speed	metre per second	m/s
	kilometre per hour	km/h
b) Wind direction	—	N, NNE, NE, ENE, E, ESE, SE, SSE, S, SSW, SW, WSW, W, WNW, NW, NNW
	degree	°
c) Precipitation intensity	millimetre per day	mm/d
	millimetre per hour	mm/h
d) Radiation (solar or heat)	watt per square metre	W/m^2

Note — Wind direction is conventionally reported as degrees measured clockwise from North as 0° to the North as 360°. Wind direction, when expressed in terms of 16 sector compass points, indicates the direction from which wind is blowing.

2.4 Time

Quantity	*Unit*	*Symbol*
Time	second	s
	minute	min
	hour	h
	day	d
	month	-
	year	-

2.5 Miscellaneous

a) Geographical location	degree latitude degree longitude	°N or °S °E or °W
b) Altitude	metre	m

NOTE — Whenever significant, minutes and seconds should also be mentioned while specifying geographical location.